TAMPERE UNIVERSITY
OF APPLIED SCIENCES

AN ANALYSIS OF MODERN RETROGAMES

Project: Queen's Meadow

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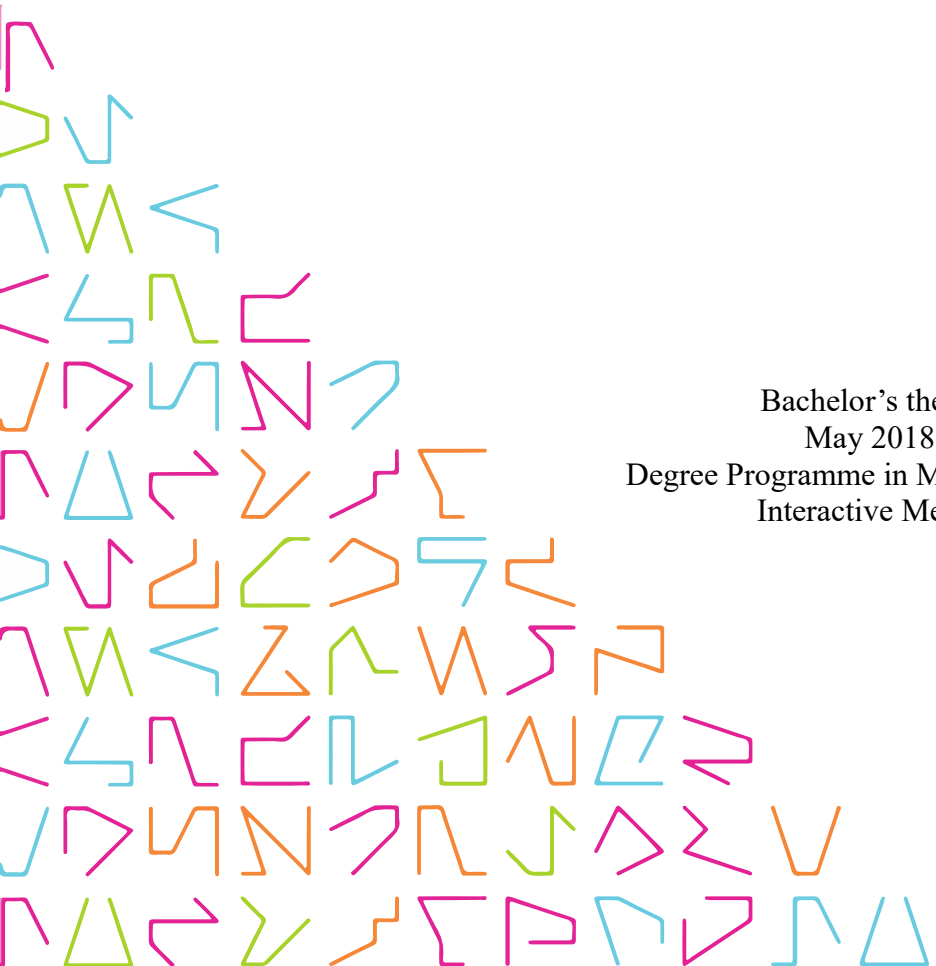

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ABSTRACT

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The purpose of this thesis was to support Queen's Meadow, a video game in development by giving deep insight into the growing trend of modern video games that were heavily influenced by classic video games of the past. Analyzing these classic games in depth gave valuable data how the industry had changed and the current trends as to how classic design was made more appealing for the modern consumer.

The data was gathered by comparing different classic video games with modern games that were clearly influenced by their classic counterparts. From this data, similarities and differences were found and taken into account as to how video game design had evolved over the years. In the analysis, it was found that certain design choices often changed in their modern iterations, whilst other design choices either remained the same, or were removed altogether. This applied to game design, as well as usability and user friendliness. The data was then used to better design the video game in development, Queen's Meadow.

Ultimately the research has had a great impact on the design of Queen's Meadow. Not only has it shown what design choices to avoid and what to potentially embrace, but it has also shown why modern game design is the way it is. Over time everything changes, and as a rapidly growing and evolving industry like video games, stopping for a moment and reflecting on where video games have come from is essential to better understand where the industry should be going as a whole.

Key words: game design, retro games, modern retrogames, accessibility

CONTENTS

ABBREVIATIONS AND TERMS

PC	Player character. A character that the player controls in the game.
NPC	Non-player character. A character in the game that the player does not control.
Stat	A statistic showing how strong the player is in a certain area of their character, usually in a role-playing game.
Skill	Can refer to either player's skill in playing the game, or an ability the player can access.
Character Build	The combination of everything the player can do to develop their character in a game. Stats, skills, gear, everything combined is a Character Build.
Respec	The ability to be able to re-allocate stats or skills so that the player can fix any mistakes they've made in their character build.
RPG	A role-playing game. A genre of video games focusing on character progression.
Paper Doll	A way of representing the player's equipment typically in an RPG. The player can often drag and drop items with the mouse onto their character's paper doll to make the character equip or use said item.
Turn-based	A game that uses a turn-based gameplay system, requires the player to take turns against the AI (or other players). On the player's turn, the player gets to make choices that the AI will respond to on their own turn, but not before.
Platformer	A genre of video games focusing on environmental challenges where the player has to use abilities to traverse a terrain, usually various forms of jumping.
Metroidvania	A genre of video games focusing on free exploration that is barred with the acquisition of traversal abilities, such as being able to double jump.

Linear Level Design	A style of level design that is accessible and easy to follow. Carefully constructed levels that are nearly impossible to get lost in, giving the player a guided, smooth experience through the levels.
Non-Linear Level Design	A style of level design that is inherently more open, allowing the player to access various different areas at once, enabling them to go to areas in whichever order they want to. Not to be confused with open world level design.
Open World Level Design	A style of level design that is almost entirely open to the player from the start of the game, allowing the player to create their own adventure in the open world.
Old-school	A term used to refer to something that is old-fashioned. In terms of this thesis, it is used to refer to video games of the 90's and earlier.
Fast Travel	A term used to refer to a system that allows the player to reach different parts of the game world instantly, instead of always having to walk there. Often requires the player to have at least once walked to a specific destination before being able to fast travel there.
UI	User Interface. Typically menus the player has to navigate to access various settings and features. These features can be but are not limited to: Inventory, Menu Screen, Options Screen, etc.
HUD	Heads Up Display. Information that player needs to see during normal gameplay and is often displayed on the screen at all times.
Alpha	A state of game development where the game is possible to complete for the most part, but is still missing vital features and is in many ways broken and not working as intended. Games that are not yet at this state, are called pre-alpha.
Beta	A state of game development where the game is feature complete, but is still in development due to its broken nature.
Steam	A digital distribution service maintained by Valve Corporation.

1 INTRODUCTION

In this thesis, I will compare several old-school games to their modern iterations. Modern games that were clearly influenced by their old-school counterparts, not made by the same developers or published by the same companies, but rather, created in the vein of the old title. I will go through the history of video games and define what a retro game is in comparison to a modern game, and what it means for a modern game to feature design choices made in the spirit of retro games.

I will also go through iterations and choices in both usability and user-friendliness, as well as compare retro games to modern games that were influenced by the classics. As I compare features and ways certain things are made, I will provide not only references to the general opinion of people, but also my own viewpoint and opinion, and how it affects the design of my own game, Queen's Meadow.

Queen's Meadow, by design, is a combination of two genres (Metroidvania and first-person RPG) that often share similarities but are regarded as two distinct genres. Because of this reason, I will compare classic games from both genres, with their more modern counterparts, gathering valuable data and use this data to design Queen's Meadow. A playable pre-alpha demo of Queen's Meadow will accompany this thesis.

The games directly compared in this thesis are Castlevania: Symphony of the Night (Konami 1997), Ori and the Blind Forest (Moon Studios 2015) and Hollow Knight (Team Cherry 2017), representing the metroidvania aspects of Queen's Meadow. Games representing the first-person RPG aspects are: Dungeon Master (FTL Games, Victor Interactive Software 1987), Legend of Grimrock (Almost Human 2012) and King's Field 4 – The Ancient City (From Software 2001).

2 GAME DESIGN

2.1. Retro Game Design vs. Modern Game Design

Game design of the 80's and 90's was vastly different from the game design of the 21st century. The industry started going through large changes in the turn of the millenium, not only for the advancement in technology, but also due to the fact that games started to get more expensive to make (Koster, 2018) and thus developers and publishers had to start finding ways to make the games they made more appealing to people who don't normally play video games, or to try and appeal to different kinds of gamers, all at the same time.

When people think about classic, or retro game design, they often think about brutal difficulty of the games and likewise, when they think about modern game design, they often talk about modern games being “too easy” or “casual”. And while it is true that games have never been as accessible and as “easy” as they are today, the subject isn't as simple as that. Regardless of this, when a modern retro game is conceived, difficulty is often a selling point, trying to get to that nostalgic feeling of games being more demanding of the player. There are entire genres revolving around difficulty and punishing game mechanics. (Extra Credits, When Difficulty is Fun. 2013)

2.1.1 Difficulty in Game Design

So what is difficulty? And why were the classic games difficult, and why are the modern games less difficult? There are many answers to these questions and the best way to go about this is by looking at the history of video games and where they came from.

The raw gameplay difficulty of a game can be tracked to the time when arcade games were at the height of their popularity, from late 70's to early 90's. The games operated in arcade halls with coins, so in order to maximize the profits these expensive machines made, the games were designed to be difficult and addictive, to make the player's pay more and play more.

> Games were difficult, sometimes brutal, in order to keep you playing, and keep you paying. (CleanPrinceGaming, The Cuphead Anomaly: The Real Problems With Difficulty. 2017)

Arcade games remained popular for a long while due to their superior graphical and sound quality when compared to home consoles (Stanton 2015, 95). When video game consoles, such as Sony Playstation and Sega Saturn started to rise in popularity, and especially when the consoles started to match the graphical quality of arcade machines, arcade games started to drop in popularity, but essentially the same developers switched to consoles with the same mindset. Console games were also expensive, and the target demographic was mainly young boys with limited income, so the games were still designed to be difficult, so that finishing a game would take a longer time. (Extra Credits, When Difficulty is Fun. 2013)

In the turn of the millenium, when technology had started to reach high levels and more technologically impressive games could be made, it soon became an apparent problem that the costs would also increase so the companies had to start making the games for a larger target group, rather than the small niche that they were comfortable with earlier. This lead to the decrease in difficulty in games in general, as well as more refined accessibility and usability. The young people who played games in the past would also be able to now buy their own games, making replayability and artificially padding the game with high difficulty less of an important design choice. (Extra Credits, When Difficulty is Fun. 2013)

This in turn however, led to an era of gaming where some of the great modern classics would be born, such as Half-Life (Valve Corporation 1998), The Sims (Maxis 2000), Deus Ex (Ion Storm 2000), Grand Theft Auto 3 (DMA Design 2001), Final Fantasy VII (Square Enix 1997), among many others, but also, a lot of the challenge that was so important in games was lost and for a while it was difficult to find those old-school, challenging games anymore. While many of even the modern classics would be seen as challenging, they weren't as much of a challenge as the older games of the early 90's and before. This would change however as digital distribution would increase through platforms such as Steam, giving smaller developers the chance to experiment with

difficulty and bring back the nostalgic feeling of the challenging, old-school games. (Extra Credits, When Difficulty is Fun. 2013)

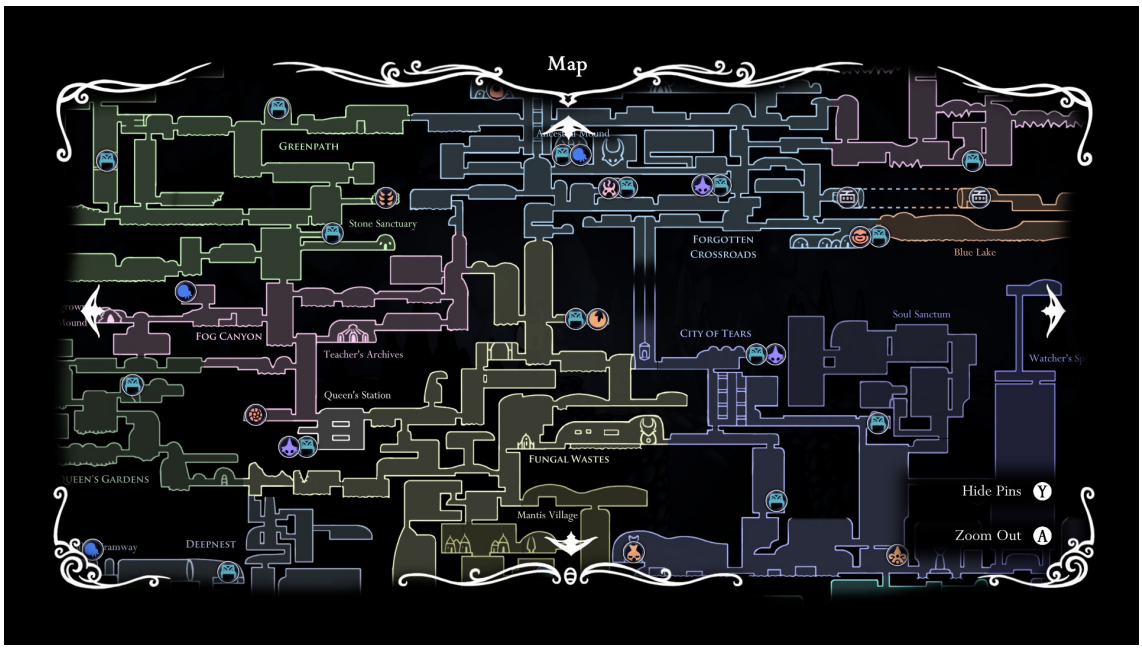
2.2. Kept Features

As the overall game design philosophy and methods have changed over the years, some features and design choices are more acceptable than others when it comes to creating modern games with a retro style. It is important to have the feeling of a retro game while avoiding the more punishing features that the classic games were often known for. This is essentially taking the best of both worlds. Taking the nostalgic feeling of challenge and style while still providing the player with the accessibility and usability of a more modern title.

2.2.1 Non-Linear Level Design

One of the design choices that every game compared in this thesis has in common, is non-linear level design. While it is true that many old-school games, especially platformers were often linear in design, non-linear level design has been a lot less common in modern games. You often see modern retro games embracing non-linear level design for many reasons. When people talk about challenge, they often mean the difficulty of combat systems and such, but in retro design, the levels were also challenges in themselves, and this has been carried over to every game in the comparisons in this thesis.

Non-linear level design goes hand in hand with Metroidvania style design. In Metroidvania games, the player has to acquire certain abilities or items in order to get into areas previously inaccessible to them. This is the very definition of non-linear level design (Thompson 2007, 108). The player can choose what paths to take but certain areas are still blocked off to ensure that the player cannot get into areas that the designer don't want them to venture to at that specific point in the game (Picture 1). So while this design can seem very open, it is still strictly in the hands of the designer, ensuring that the overall game will be paced and balanced correctly.



PICTURE 1. The map in Hollow Knight is large and complicated. (Hollow Knight 2017)

2.2.2 Character Progression

When it comes to classic and modern game design, character progression has always played an important role. In classic games, progression systems were almost entirely for RPGs or Metroidvania games, and were rarely seen in other genres. However, due to the addictive nature of upgrading your character in game, the character progression system started to get into many more modern games, regardless of the game's genre. For example, even shooter and sports games started get character progression systems. However, the difference between classic and modern character progression, is often the importance of the player's character build. In many old games, especially RPGs, character progression is vital to survival. A bad character build could result in an unwinnable scenario where the player is simply too weak to progress, due to the player's inability to build their character and progress them correctly.

It is important to remember that progression is often divided into two categories: Player progression and Character progression. This is the balance of the player getting better at understanding and using the mechanics of the game and the player's character getting better at their skills and abilities. Different games place differently on this scale and some games rely more on the player's own ability to play the game, such as Dark Souls

(From Software 2011) where it is possible to complete the game without ever upgrading the player's character once. Likewise, some games are impossible, or at the very least close to impossible with only the player's own skill, like in Final Fantasy VII. The difficulty is balanced so that the player's character gets better over the course of the game as well as the player themselves at the mechanics of the game. (Bycer, J. 2013)

PICTURE 2. The stat and skill screens in Legend of Grimrock. (Legend of Grimrock 2012)

In modern retro games, the character progression is balanced somewhere in between these two extremes of executing progression. This means that character progression, and doing it properly is important, but it is more difficult to create a completely unwinnable situation. Abilities or items that are crucial to succeed in the game are often much better telegraphed to the player in modern games, while in some old games it was possible to miss an item or an ability early on in the game only to later realize you can't get it anymore, and it is needed to progress, thus barring the player from progressing in the game. In more modern titles this is handled in such a way that if the player needs a certain key item from an area they are in, it is impossible to leave the area before taking the item, usually barred with an obstacle or an event that plays out after the player has taken the key item.

PICTURE 3. The Ability Tree in Ori and the Blind Forest. (Ori and the Blind Forest 2015)

A feature that is also often seen in the more modern titles with character progression, is a respec option, meaning that in one way or another, the player is able to reset their progression and be refunded all stat- or skill points they have invested into the character, letting the player try a new character build without having to redo any of the game's content. In some games the player can always swap around their abilities, encouraging experimentation with different abilities as well as letting the player adapt to certain situations with relative ease. Often the respec option also comes with a cost, either via the cost of in-game currency, or the cost of a rare item. (Extra Credits. Progression Systems – How Good Games Avoid Skinner Boxes. 2015)

PICTURE 4. The Charms screen in Hollow Knight. The player can freely swap charms without penalties. (Hollow Knight 2017)

2.2.3 Skills, Abilities and Tactics

Using character skills or abilities in a tactical manner has been a staple in game design ever since the first video games were conceived, regardless of the genre. This could be as simple as the effective usage of jump in Super Mario Bros (Nintendo 1985) , or as complicated as a list of different magic spells in Final Fantasy and knowing which spell to use in any given situation. Depending on the genre, games usually approach the design of skills in different ways. A first person shooter can approach skills in a very practical manner, having the ability to jump, lean around corners, or being able to shoot different weapons, like in Half-Life. And in a different genre, like an RPG, the game can have a complex set of skills that the player character can learn, ranging from the handling of different weapons and armor, to being able to heal wounds, or be more effective in diplomatic conversations with an NPC, such as in the Fallout (Black Isle Studios 1997) series.

Like many other features and systems, the design of skills and abilities have also gone through a lot of changes throughout the years. Many of the more complex skill systems in games have been streamlined to be more accessible. For example, in the original Deus Ex, the player has to choose which weapon type they wanted to focus on, from

melee weapons, pistols, rifles and heavy weapons such as rocket launchers. But in a more modern sequel, Deus Ex: Human Revolution (Square Enix 2011), the player has to make no such choices. The player can use all weapons just as effectively from the beginning of the game. This is an example of streamlining a system in the game that was deemed either unnecessary or too complicated. While streamlining needlessly complex systems is a good thing, streamlining too much can also make the game feel stale and give the player the feeling that their choices don't matter. In Deus Ex: Human Revolution, the player still has the choice of upgrading their favorite weapons, making them more effective than other weapons. This can be seen as an improvement in a way that the player does not have to make longterm choices before they've had a chance to try out different weapons. In the original Deus Ex, it was possible to upgrade a weapon skill before even owning said weapon.

2.3. Removed and Changed Features

Of course, as some features are salvaged into the modern iterations of classic style games, some features are also removed or at the very least, changed drastically. These features often contain something that punishes the player in some way that is deemed to be too brutal in modern game design, such as permanent death and loss of progress. Other features that are often changed has to do with the amount of management and going through menus the player has to go through, often leading into streamlining of certain menus, such as inventory screen or a journal screen.

2.3.1 Complex Inventory Management

Inventory management is often a feature that the player has to utilise in a game that has some sort of RPG elements in them, and in full-fledged RPGs it is almost always a necessity. Inventory management is often seen as a nuisance for most people, and thus many ways to streamline it has been done over the years. There's no perfect way to do it and it is always important to take into account what kind of a game is in question. Inventory management is not necessary in many games and in such games, it's a good idea to not implement an inventory system at all, or streamline it into such extreme lengths that it barely passes as a proper inventory system.

In games where inventory management is important, it is often crucial to design it in such a way that it is accessible and intuitive and lowers the amount of micro management that the player has to do. In classic games, and especially in RPGs there was often a limit to how much the player can carry, limited either via a grid where the items would take a certain amount of space or a weight system where the item's weight is taken into account, or sometimes even both, creating a system where the player has to keep track of not only the item's size, but also its weight.

A good inventory system can help the designer to balance the game as well as make the player to make difficult choices during gameplay, such as whether or not they should take extra healing items with them or not, or if they should try and carry a heavy weight item back to a vendor and sell it for profit. But as mentioned earlier, a bad and clunky inventory system can be a nuisance. It is often frustrating to go through a ton of items

that you're not sure what they are used for and if you're ever going to need them. It is also easy to start hoarding items instead of using them, resulting in inventory management problems where the player has so many items in their inventory, they need to constantly manage it to pick up new items, going through all the items and calculating what items are worth keeping and which items are worth replacing. It is just as frustrating and annoying as it sounds most of the time, and while technically it could be seen as the fault of the player for not using items and picking up every item, it is important to know that it is the way many people want to play games and so it should be taken into account when designing games.

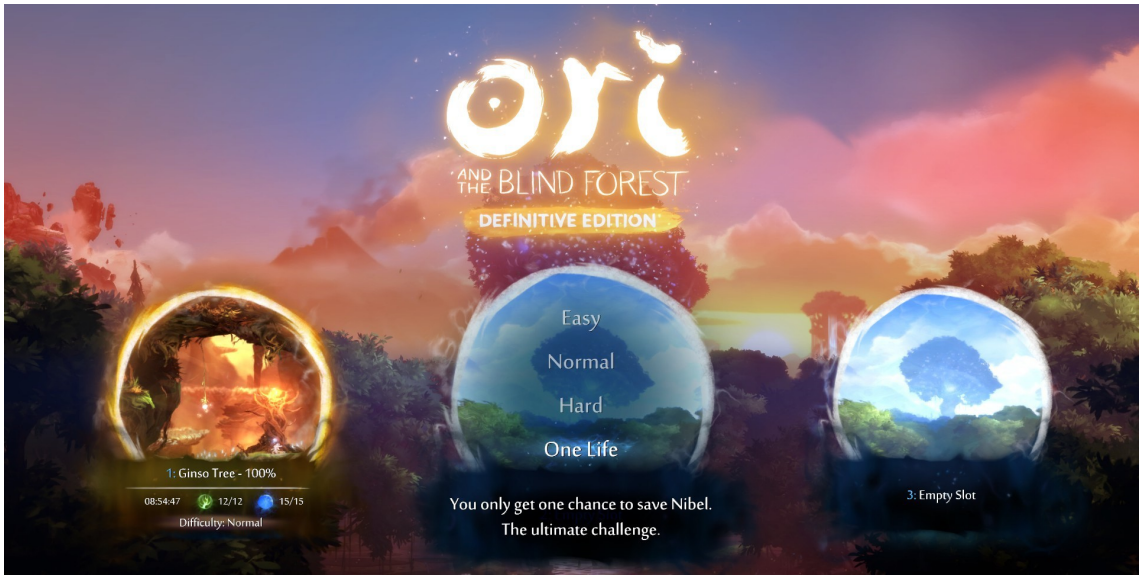
2.3.2 Punishing Mechanics

While it is true that challenge has always been held in high regard, even as video games started to get “easier”, there are several mechanics that often lead to nothing but frustration. These mechanics are punishing, not challenging. They make the games artificially more difficult, meaning that the difficulty doesn't come from a proper challenge, but from punishing gameplay elements. (Extra Credits, When Difficulty is Fun. 2013)

Perhaps the most brutal type of punishing mechanics, is permanent death. Meaning that when the player dies, they are dead and will stay dead until they start the entire game from the very beginning. (Doull, A. 2009) Needless to say, this is an extremely brutal feature and even in many old-school games there were ways to save your game or have passwords that would let you continue from a later stage in game, but that was not always the case. There are many games that feature permanent death and when games started to get more mainstream, almost all features with similar level of punishment were removed.

As mentioned earlier, as digital distribution grew and smaller indie developers were able to start experimenting with difficulty and more hardcore mechanics, permanent death got a return of sorts. There are many modern indie games that feature permanent death, such as The Binding of Isaac (Edmund McMillen 2011) and Rogue Legacy (Cellar Door Games 2013), among many others, but many of these modern games feature some sort of an unlocking system. The player would play the game normally, unlock things and

then die, and upon starting the game again, the player would have the unlocks, but otherwise would have to start the game from the beginning. (King, A. 2015). As seen in several games I compare in this thesis, some games that don't have permanent death as a central mechanic, have optional “ironman” modes and such (Picture 5), where the player only has one life to get through the entire game and upon death, they have to restart the game from the beginning. These modes are easy to develop and offer additional challenge for those who really want to experience everything the game has to offer, even if it means pouring hundreds of hours into the game.



PICTURE 5. The One Life challenge in Ori and the Blind Forest. (Ori and the Blind Forest 2015)

2.3.3 Save Systems

Saving the game is the action the player has to do in order to save data and be able to continue the game at a later date, and being able to continue from the spot they had stopped playing in, retaining any and all progress they had made up to that point. Save systems in modern games are practically in every game and it is an essential system that realistically a developer cannot ignore. It is expected from every single game. That being said, save systems are difficult and complicated to make and especially in the older games, from the early 90's and before, save systems were rare and often difficult to use. (Downward Thrust. Breakdown: The Evolution of Video Game Difficulty. 2016)

The early examples of saving systems were games that gave the player a password (Picture 6) that they could use in order to return to the spot they stopped playing on later. One of the games using a password system was an action roleplaying game Faxanadu (Hudson Soft 1987). The problem was that these passwords were often extremely long and complicated, making it a huge hassle to keep track of your passwords, and almost always meant that the player would have to write them down somewhere, as well as simply inputting them was complicated in a console game with no keyboard. Some older games, even on a NES (Nintendo Entertainment System) had non-password save systems, but it would require an effort from the developer to create save game systems into the game cartridges themselves since the games themselves wouldn't be able to write and read such data.

PICTURE 6. The passwords in Faxanadu were long and complicated. (Faxanadu 1987)

Near the end of the millenium, consoles would often have memory cards where the save game data could be stored (Moran, 2010), but they were often slow and would require the player to save at designated “save points”. As harddrives became more common in consoles, more dynamic “checkpoint” based saving systems would be used, where the game progress would be saved often, almost after every encounter or an obstacle, meaning that should the player fail, they wouldn't have to go all the way to the previous save point to resume playing. (Sirlin, D. 2008).

Save systems are often tied to the difficulty of the game due to the brutality of having to replay large amounts of content upon failure, and while this is true, it's not the whole truth. While having limited save points certainly makes the game more challenging, the difficulty then doesn't come from the raw mechanics of the game, but rather from the fact that the player has to potentially replay a lot of content. (Sirlin, D. 2008). However, in my opinion by having the player find save points or think about the last time they saved, can also generate a lot of tension, accentuating an already tense game to even further. Whether or not this is a good, or correct way to raise tension is subjective and debatable. Allowing the player to save whenever they want can lead to tension breaking moments, such as using a steal skill in the Fallout series. The player could save the game, use their steal skill to steal powerful equipment (that is difficult to steal) from NPCs and should they fail, they can just load their save file and try again until they succeed, breaking any tension that comes from stealing in game. On the other end of the spectrum, there is Kingdom Come: Deliverance (Warhorse Studios 2018), where the player can only save when sleeping in a bed, or using an expensive item. This might be an effective way to bar the player from cheating by saving their game constantly but all players have lives outside of the game and not letting the player to comfortably quit the game when needed isn't exactly acceptable either.

3 USABILITY AND ACCESSIBILITY

3.1. UI and HUD Design

In games, it is important that the player can easily play the game and get all the necessary information that the player needs to succeed as easily as possible. These things include but are not limited to: Player's health, selected weapon, current goal, or a map. If these things aren't available to the player easily, it can lead to frustration. This is where designing usability and accessibility comes in. This can refer to multitude of different areas of game design, but I will be concentrating on UI and HUD design.

I will differentiate UI design from HUD design by the simple notion that UI is the menu, and menus that the player needs to navigate, such as inventories or settings menus. While HUD is the information that the player sees on the screen upon normal gameplay and usually at all times.

3.1.1 UI Design

The UIs and menus have changed a lot over the course of the last few decades, and often we as players may not even notice it, but certain trends have certainly come and gone over the years. In the 90's and earlier, games had extremely minimalistic menus, often only having one or two options to choose from, accompanied with minimalistic, blocky and repetitive art. Over the years, not only more menu choices would become available, ranging from settings to extras and such, but also the visual style and how the menu is presented would change. (Prell, S. 2018)

Early menus were often just several options on a simple background, when you were in a menu, you knew you were in a menu because the game didn't look anything like the menu did. It became a trend in the 2000's to integrate the menus to be a part of the game world, for example, in Dragon Age: Inquisition (BioWare 2014) the main menu shows the player a large building in the background and dozens of mages and templars walking towards the building. You immediately feel like the menu is part of the world, and upon pressing the button to start a new game, the building in the background will explode, thus setting the tone for the story and what is going to happen next. The destruction of the building is immediately explained after the game has started and thus it makes the main menu of the game an integral part of the world, and not just visually but also thematically (Picture 7).

PICTURE 7. The main menu of Dragon Age: Inquisition. When the player presses new game, the building in the background will dramatically explode. (Dragon Age: Inquisition 2014)

3.1.2 HUD Design

HUD design is categorized into four different categories: Diegetic, Non-Diegetic, Meta and Spatial. Each of these have the same basic function of communicating information to the player, such as the health of the player or their current objective. The differences

however, are large and it's important to understand them and understand what kind of a category suits the game you are designing. (Stonehouse, A. 2014)

Non-diegetic HUD is by far the most common. It fits into virtually any game but it can also be a hinderance sometimes. Non-diegetic HUD is on a 2D plane, drawn on top of the gameplay screen, regardless of whether or not the game itself is 2D or 3D (Picture 8). The strength of a non-diegetic HUD is its clarity. Unlike the other categories, non-diegetic, in its essence, is not obscuring. However, there may be instances where a non-diegetic HUD is used in an obscuring way but that is a fault of the art design, and not the non-diegetic category itself. Typical usages for a non-diegetic HUD element are health bars, floating damage values or a quickbar that shows the player's items or abilities for quick access. (Stonehouse, A. 2014)

PICTURE 8. The non-diegetic HUD of Paladins: Champions of the Realm. Several elements of the HUD, such as the character silhouettes are diegetic. (Paladins: Champions of the Realm 2016)

A diegetic HUD is drawn into the game world itself, rather than a 2D plane. This is typically done in a first person game but is seen in third person 3D games as well. Diegetic HUDs are often seen only in 3D games but it's not impossible to implement it into a 2D game but it may be more trouble than it's worth. The strength of a diegetic HUD is that it can significantly increase the player's immersion. There are no bars or numbers on the screen outside of the game world, and thus the player can better

immerse themselves into the game. Information however, has to be communicated to the player, and in diegetic HUDs it's often done with objects that the player carries (Picture 9), such as a clock on their wrist that the player can take a look at, a map object that the player holds, and sometimes a gun the player wields can have a screen on it, displaying the ammo left in the gun. These are all examples of a diegetic HUD. (Stonehouse, A. 2014)

PICTURE 9. The diegetic inventory screen of Dead Space. The screen floats in front of the player and the angle of the camera can be changed at the same time. (Dead Space 2008)

A meta HUD is often used in modern shooters and some action games, and a meta HUD communicates information to the player in an indirect way, such as indicating the player's health via making the gameplay screen's edges bloody, or de-saturating the colors of the screen. This method is often unclear and can lead to situations where the player can't tell if they can still take one more hit from the enemy or not. It can be used to great effect to increase tension however. (Stonehouse, A. 2014)

Finally, there's the spatial HUD. A spatial HUD is implemented directly onto the game world. It can be text on the surface of an object, telling the player what to do, or it can be a line on the ground, telling the player which way to go. (Stonehouse, A. 2014)

In my personal opinion, non-diegetic HUD is the optimal choice for most games, especially if the game requires tight player control. And generally, the faster the pace of the game, and the more skill-based the game is, the more likely non-diegetic HUD is the right choice. For me, gameplay always comes first, and it is crucial that the player can see all the necessary information at a glance. Hiding basic information such as health behind a menu, or indicating it unclearly with a bloody screen or such, leads to frustration more often than not. In a more exploration focused game without constant risk, or generally a slower pace of gameplay, other HUD categories can work wonders, and a non-diegetic HUD might take away from the experience in that case. But I think the designer has to really think hard what kind of a HUD fits their game.

4 COMPARISONS

4.1. Dungeon Master, Legend of Grimrock and King's Field 4

Dungeon Master was released in 1987, developed and published by FTL Games and Victor Interactive Software. It's a party-based RPG where the player explores a complex dungeon, solving puzzles and fighting enemies. Similar games during that time were mostly turn-based, which was one of the pivotal changes Dungeon Master made to the RPG formula. The exploration and combat all worked in real-time, eventhough player movement was still restricted to 90 degree turns and tile-based movement.

PICTURE 10. Dungeon Master gameplay screen. (Dungeon Master 1987)

Legend of Grimrock was released in 2012, developed and published by Almost Human. It is considered to be heavily influenced by Dungeon Master, often regarded to being the modern iteration of Dungeon Master. In Legend of Grimrock, the player controls a party, just as in Dungeon Master, exploring a complex dungeon, solving puzzles and fighting enemies. Released 25 years apart, the most notable difference to Dungeon Master is obviously the graphical fidelity, but Legend of Grimrock does a lot of things to change the old design, while still keeping the spirit of Dungeon Master alive.

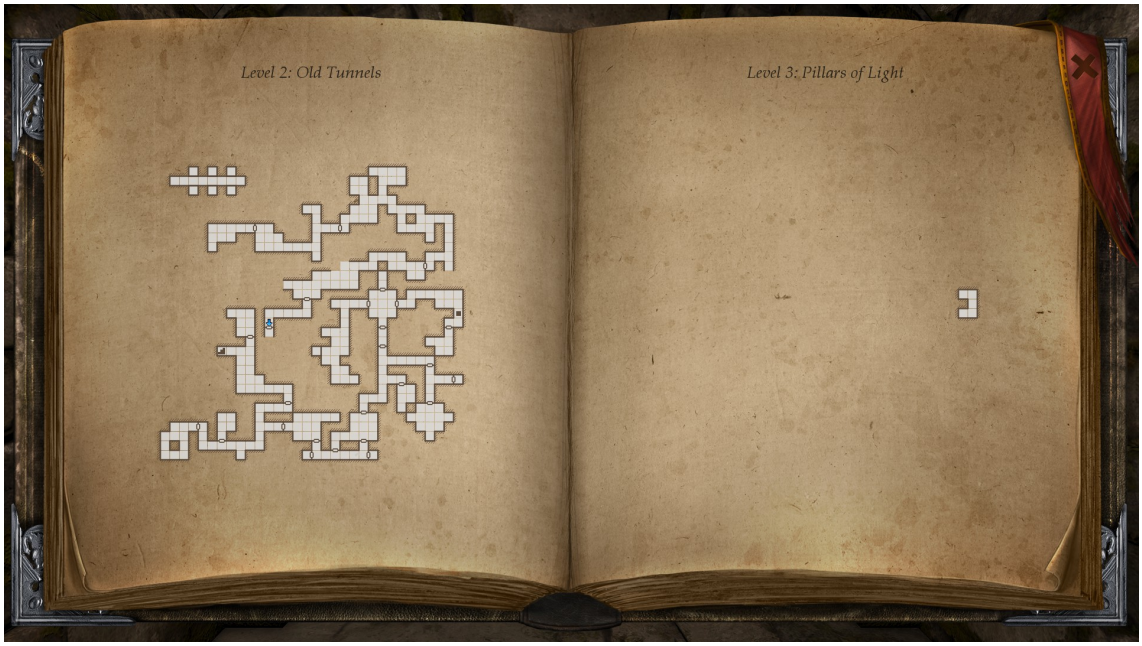
PICTURE 11. Legend of Grimrock gameplay screen. (Legend of Grimrock 2012)

King's Field 4 – The Ancient City was released in 2001, developed and published by From Software. King's Field 4 – The Ancient City is a first-person RPG where the player controls just one character, and not a party of characters like in the other games in this comparison. A cursed idol that is responsible for the destruction of an ancient race has appeared again to the world, wreaking havoc. It is the player's goal to return the idol to the Ancient City and break the curse.

PICTURE 12. King's Field 4 – The Ancient City gameplay screen. (King's Field 4 – The Ancient City 2001)

4.1.1 Map Systems

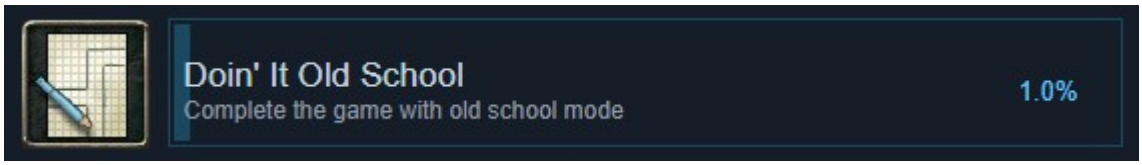
When it comes to accessibility and usability, not giving the player a map is often an unacceptable design choice in modern games. Dungeon Master had no map and the levels in the game were extremely complex and labyrinthine in nature. The fact that almost every surface looked more or less the same certainly didn't help either. It was common that players had a graph paper, or similar, to where they would draw out the maps themselves. Due to the game's tile-based movements and 90 degree turns, the graph paper helped players to visualize the dungeon as they explored it. But as mentioned before, this is not acceptable in modern game design. Some games, such as Salt and Sanctuary (Ska Studios 2016) are condemned for not having a map. In Legend of Grimrock, the developers added an automatic map into the game that would be filled out automatically as the player explores the dungeon further (Picture 13).



PICTURE 13. The automatic map in Legend of Grimrock is in form of a book where different pages are different levels of the dungeon. (Legend of Grimrock 2012)

However, as not having a map in Dungeon Master, and having to draw the maps onto a graph paper, was something you had to do, and many people feel nostalgic about that, the developers added an optional “Old-school mode” into Legend of Grimrock, that disables the automatic map from the entire game, forcing the players to use graph paper again, just like 25 years ago. This is a great example of modernization of a classic design while still keeping even the more hardcore features of the classic game alive, via optional challenge settings. It is unlikely that many people would finish the game in old-

school mode, as the in-game achievement for doing so, only has a 1% completion rate but it is a great example of how far certain developers are willing to go to deliver the authentic experience of their greatest inspirations. (Picture 14).



PICTURE 14. Old-school mode achievement completion rate (Legend of Grimrock 2012)

In King's Field 4 – The Ancient City, the player is able to find different kinds of maps throughout the game world. The first maps the player can find are just paper maps or maps carved on stone. They are static, and the game won't even tell the player where they are on the map upon viewing it. The early maps in the game leave a lot to be desired for and for the most part, their usefulness is limited. Later in the game, the player is able to find a magical map (Picture 15), that will show the player a fully 3D view of the game world, letting them turn and rotate the map however they want. While the map is aesthetically impressive, the player can get it so late in the game that most of the game world has already been explored at that point, so the usefulness is once again limited.

PICTURE 15. A paper map and a magical 3D map in King's Field 4 – The Ancient City. (King's Field 4 – The Ancient City 2001)

While having a map in the game isn't mandatory and can even be a justified design choice, to increase the mystery of the world and enhance the player's experience when it comes to exploring. However, it is important to understand what kind of a world the game has. Generally, it is easier for a 3D game to not have a map due to the increased environmental awareness that the player has, being able to look around in 3D space, while in a 2D game the player's view is often limited, making it harder to understand where different areas are in relation to others. This being said however, in a 3D game, it is crucial that the world and its levels are well-designed with all of this in mind, giving the player distinct landmarks that they can recognize and making different areas and locations varied, in architecture, landscape or mood. For example, in a game like Salt & Sanctuary, the world is 2D and the player's view of the game world is limited, yet the game world is extremely large and sprawling. It is extremely easy to get lost due to not being able to see further than what the camera allows. Likewise, in a game like Dark Souls, which also has a very sprawling and complex game world, doesn't always suffer from the same problem due to its 3D nature. The player can recognize landmarks and buildings in the world that will help them navigate without a map.

4.1.2 Inventory and Equipment Systems

As mentioned earlier, inventory systems are important in RPGs and due to their complex nature, some games fair better than others in the execution of inventory systems. The more complex the game, the more complex the inventory likely has to be since inventory system is often tied to the equipment system of the game, and its complexity often increases with the complexity of the game. For example, in a game like Grand Theft Auto 3, the only inventory items the player has to worry about, are weapons and ammunition, so there is no reason for the developer to add a complex inventory system. A simple weapon selection bar is enough that the player can cycle through with a press of a button. In a game like Fallout however, the player has to keep track of all kinds of belongings, including but not limited to: Weapons, ammo, medical supplies, keys, containers, food, drink, etc. All of these items also have weight so the player is required to optimize their inventory.

In Dungeon Master, the game takes into account four party members, each of the character's inventories, both the size of the inventory indicated with square slots, as well as the weight of the inventory in total (Picture 16). If either size or the weight reaches its limits, the character cannot carry any more items and the items have to be either dropped, or given to another party member. In Legend of Grimrock, the system is similar but it has been greatly refined. The slot grid is much better laid out in Legend of Grimrock (Picture 17). Instead of two grid lines, there are three instead, helping the visualization of the inventory as a whole. It is also possible to carry bags and other containers which will reveal more inventory space inside them. Dungeon Master sacrifices part of the inventory screen itself to do this, while Legend of Grimrock opens up a separate bag window to the player's mouse cursor, with its own grid for items.

PICTURE 16. Dungeon Master inventory screen. (Dungeon Master 1987)

PICTURE 17. The inventory and equipment screen in Legend of Grimrock. (Legend of Grimrock 2012)

Using and examining items is also streamlined in Legend of Grimrock. In Dungeon Master, the player's selected character has two slots on top of their paper doll represented with an eye and a mouth icon. If the player wants to examine an item, they must drag the item onto the eye icon, and if they want to eat or drink the item, they need to drag it onto the mouth icon. Equipping items is done by dragging them onto the corresponding slot on the paper doll. In Legend of Grimrock, eating or drinking an item is done by either dragging the item onto the character's portrait, or simply right-clicking the item in the inventory. Likewise, examining items isn't necessary manually, the game will simply show a tooltip whenever the player moves their mouse over an item.

King's Field 4 – The Ancient City takes a different approach to inventory and equipment management. Both Dungeon Master and Legend of Grimrock have the advantage of being PC games and thus benefiting from mouse controls, which are often much better suitable for a complex inventory. King's Field 4 – The Ancient City is a console exclusive game, meaning that the game is designed with a controller in mind. Due to

this, the game uses a very classic, albeit outdated console UI for inventory and equipment management (Picture 18). The player's inventory is unlimited so the player doesn't need to worry about weight or the size of their inventory when it comes to hoarding items. While this can be considered a good thing due to the fact that the player won't have to worry about the inventory, the downside is that the player can only see seven items on the screen at once, and since the inventory isn't limited, by the end of the game, the player has to scroll through pages and pages of items to find that one item they were looking for. The inventory is also slow and clunky, adding more frustration.

PICTURE 18. The inventory screen in King's Field 4 – The Ancient City. (King's Field 4 – The Ancient City 2001)

The real problems start with the equipment system however (Picture 19). The player is able to equip their character with 10 different types of equipment. But instead of having a list visible at all times, the player has to choose the category to which they want to place an item by pressing up and down, and only one category being visible at any given time, and then press left and right to choose an item they want to equip to the current slot. This is extremely clunky and difficult to manage, especially in situations where the player has to frequently change equipment. For example, early on in the game, the player can find a club and a shield. The player will likely equip them and then press on into a mine area in the game. This mine is filled with wooden barriers that can only be broken down with a pick axe the player can find in the mine. The pick axe does no significant damage and uses both hands. The player has to frequently switch to the

pick axe which will then unequip both the club and the shield. Then they will break the barrier, and have to change back both the club and the shield in order to fight enemies effectively. This has to be repeated numerous times during the mine section of the game. The only thing giving an overview to the player about the currently equipped items, is the paper doll to the right of the screen that shows the player character wearing the equipped items. Alternatively the player can open up a list of all equipped items.

PICTURE 19. The equipment screen in King's Field 4 – The Ancient City. (King's Field 4 – The Ancient City 2001)

4.1.3 Combat Systems

Out of the three games, Dungeon Master and Legend of Grimrock have quite a lot in common, whereas King's Field 4 deveates from the norm here. All three games have a real-time combat system but both Dungeon Master and Legend of Grimrock are grid- as well as party-based. In King's Field 4 the player controls only one character and can turn and move the character freely.

In both Dungeon Master and Legend of Grimrock, the party members have two hand equipment slots that the player can click on, making it perform the action that comes with the equipped item. The formation of the party members is also important. The party is divided into two rows: Front and back. Character in the front row can attack with any weapon while the characters in the back row can only attack with long range

weapons, making the back row ideal for archers and spellcasters. The player can switch the places of each party member on the fly. By clicking on the equipment icons, the corresponding action will be played out, and after the action the item will go on a brief cooldown and cannot be used again for several seconds. This system hasn't changed a whole lot from Dungeon Master to Legend of Grimrock, but it has been streamlined slightly and it's easier to understand. In Dungeon Master, when the player clicks on a weapon icon, a list of options comes up where the player can either choose to slash or chop with the current weapon, among other weapon skills if they are available. This would make sense maybe in a turn-based game but in a real-time game like Dungeon Master, it adds extra button presses to a combat system that requires the player to act quickly. This system was changed in Legend of Grimrock, giving each weapon only one function, with the exception of spell casting.

In both Dungeon Master and Legend of Grimrock, the player has a set of runes they must combine in order to create spells that they can cast. No information about runes are given to the player at the start of the game, and the player must find scrolls with runes written on them to learn new spells, or simply trying out different combinations. A proper aptitude in spellcasting is also required so that the player cannot use extremely powerful spells in the beginning of the game, should they know or guess a correct rune combination. This system, while being complex and difficult to manage in a real-time combat environment, adds a certain level of depth to spellcasting, and also balances it. Spells are powerful, and combining the runes in a hectic situation requires skill from the player to pull off correctly. Spells also consume mana, which is a powerful resource that isn't always as easy to replenish as health is, meaning that the player has to learn to manage their mana effectively and not waste it on enemies that are much easier to take care of with only melee fighters. In King's Field 4 – The Ancient City, the magic system is completely different, and much more streamlined. The player must find elemental crystals that teach the player spells which they have to then equip in a menu. Only one spell can be equipped at any given time and by pressing the cast button, the selected spell will be cast, at the cost of player's mana power.

As mentioned earlier, in King's Field 4 – The Ancient City, the player only controls one character so the combat system is understandably very different to Dungeon Master and Legend of Grimrock. The combat is very slow even though it works in real time. It is also entirely based on the character's position and stamina. Whenever the player swings

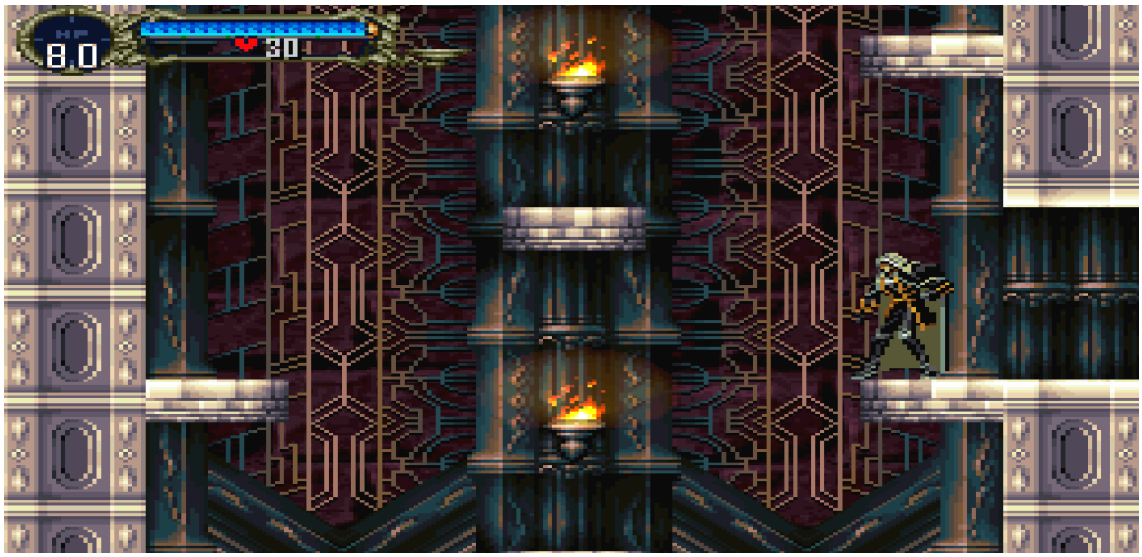
their weapon, it will drain the player from all of their stamina, and the stamina will then slowly regenerate, depending on the weapon the player is using. The player can attack even if the stamina isn't full but will suffer a significant penalty in the damage of the swing, so in most cases it is ideal to wait for the stamina to regenerate to the maximum, and use that time to better re-position to be able to attack the enemy more efficiently.

TABLE 1. Conclusion comparison of all three games.

	Dungeon Master	Legend of Grimrock	King's Field 4
First-Person Perspective	X	X	X
Automatic Map		X	X (late game)
Weight Based Inventory	X	X	
Space Based Inventory	X	X	
Real-time Combat	X	X	X
Grid-based Combat	X	X	
Rune-based Spells	X	X	
Stamina Management			X

4.2. Castlevania: SotN, Hollow Knight and Ori and the Blind Forest

Castlevania: Symphony of the Night is a game developed and published by Konami in 1997. The game was not succesful when it first came out, but it later became a cult classic and regarded by some as one of the best games ever made. More important however, is the legacy that Castlevania: Symphony of the Night left. It popularized the "Metroidvania" genre, a genre that came from the specific style of world design that both Metroid (Intelligent Systems 1986) and Castlevania utilized at the time, hence the name of the genre. This particular style of world design has since been seen in many indie games that try to emulate the classic metroidvania style in modern ways. One of these games is Ori and the Blind Forest, an extremely popular metroidvania platformer, and a more recent game, Hollow Knight.



PICTURE 20. Castlevania: Symphony of the Night gameplay screen. (Castlevania: Symphony of the Night 1997)

Ori and the Blind Forest, developed by Moon Studios and published by Microsoft Studios in 2015 is a metroidvania platformer where the player controls Ori, a guardian spirit through a slowly corrupting forest. The game's heartbreaking story, beautiful aesthetics and challenging gameplay made it a huge hit, selling over a million copies world-wide.

PICTURE 21. Ori and the Blind Forest gameplay screen. (Ori and the Blind Forest 2015)

Hollow Knight, developed and published by Team Cherry in 2017, is a metroidvania game where the player controls the titular character through the long since abandoned kingdom of Hallownest, discovering ages old secrets, meeting adventurers, exploring mysterious areas and fighting monsters.

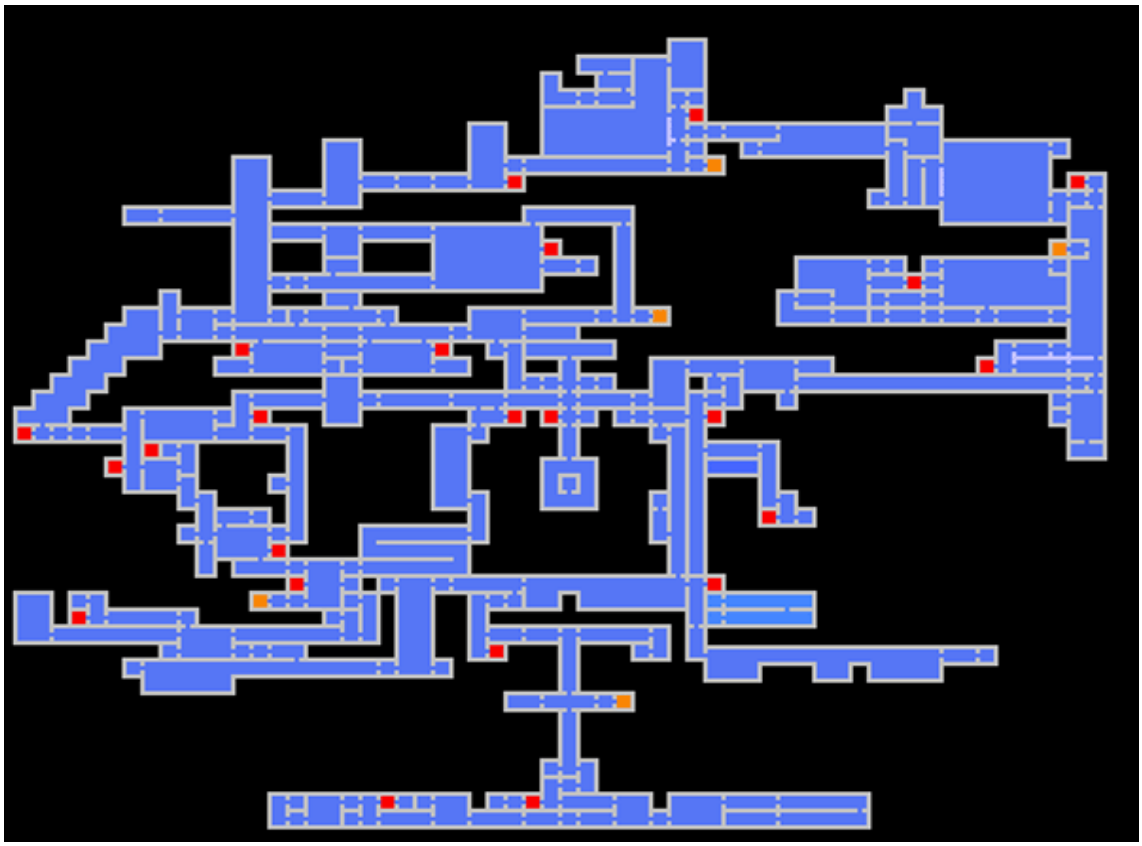
PICTURE 22. Hollow Knight gameplay screen. (Hollow Knight 2017)

What these three games have in common, are that they are all metroidvanias, side-scroller platformers with a heavy focus on exploration, upgrading your character and fighting enemies.

4.2.1 Map Systems

Each of the three games has a map system, but in every game it works differently. I will go through all of them and list what makes each game's map systems good and also what parts could use improvements.

In Castlevania: Symphony of the Night, the player unlocks more of the map every time they enter a new room. Each room is self-contained and upon entering, the room is added to an easy to read map where the white lines are walls and blue background means an explored room. Rooms with red backgrounds indicate a room that has a save point in it. Rooms with orange backgrounds indicate a room with a teleport in them, allowing the player to teleport between orange rooms for easier access to different parts of the map (Picture 23).

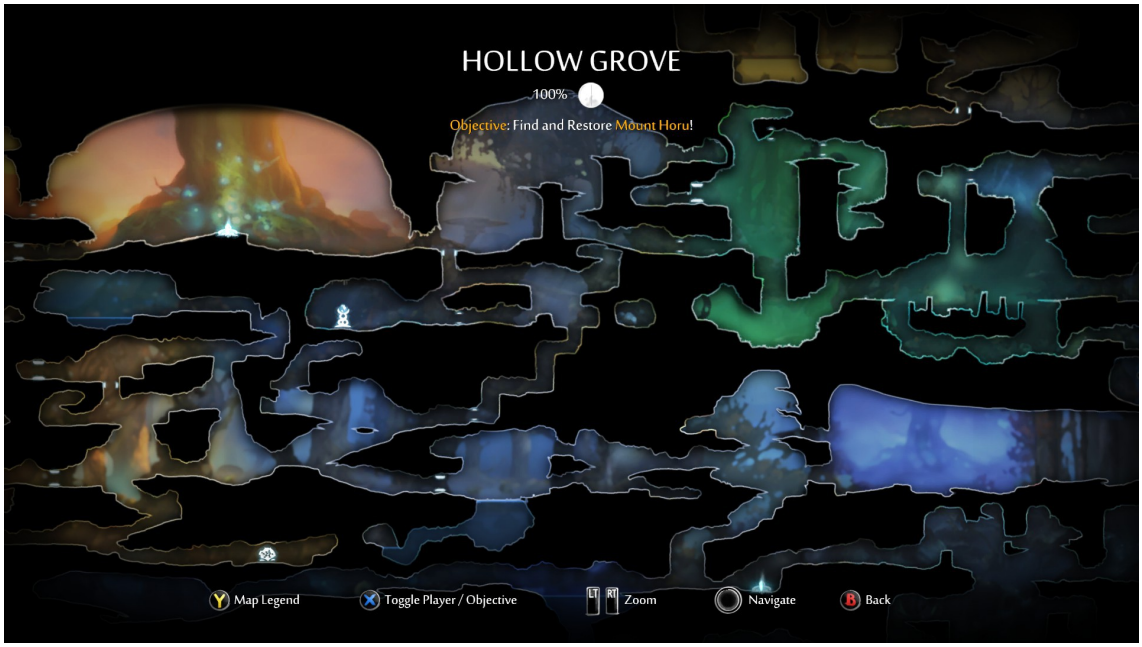


PICTURE 23. The map of Castlevania: Symphony of the Night. (Castlevania: Symphony of the Night 1997)

Castlevania: Symphony of the Night's system is clear and intuitive. It is instantly understandable and never gets in the way of the player, allowing them to easily tell where they are, where they can save the game and where the fast travel rooms are. However, one problem this map screen has is the fact that every room is colored blue. Only the special rooms are color-coded but it is difficult to tell which part of the map is which. For example, if you remember a locked door in a certain area of the map and then, much later in the game have gotten a key that allows you access the locked door, it is hard to remember where the locked door was since every room looks the same on the map, and the map gives you no indication of locked doors, or even where different areas change.

In Ori and the Blind Forest, the map system is clear to look at, and as the different areas are colored similarly to what they look like in-game, it is easier to see where different areas change and easier to remember if you have to return to a specific point later. The map system also features an overview map of the whole game world, allowing the player to easily see all of the areas in the game and the player's progression in the areas, as well as where they need to be going next, all of this at a glance. The player can then choose an area on the overview map and afterwards be shown the local map, showing all of the details of each map.

PICTURE 24. The overview map in Ori and the Blind Forest. This map is used to view the entire game world. (Ori and the Blind Forest 2015)



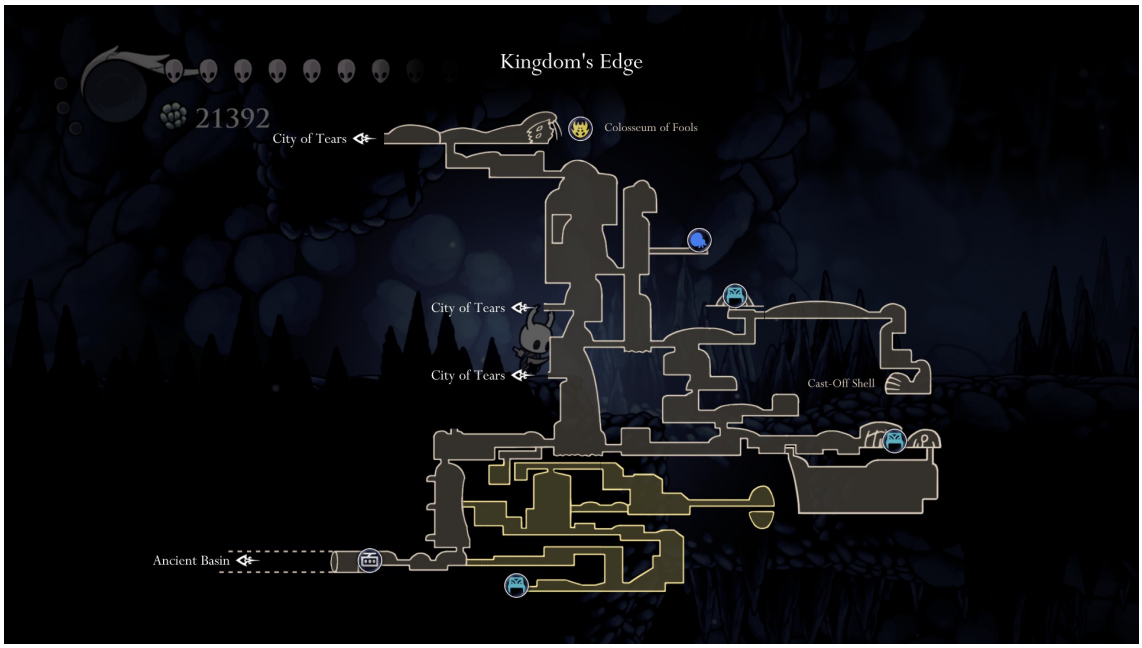
PICTURE 25. The local map in Ori and the Blind Forest. (Ori and the Blind Forest 2015)

The map system in Hollow Knight is perhaps the most complicated of the three games. In a game about exploration, a map is a vital tool to be able to tell where you are and where you need to be going, but at the same time, it can also take away from the experience. When the player is without a map, they can get the feeling of "being lost" or being on an actual adventure and not just running through rooms in a grid. Of course, this is highly subjective as to which system each player prefers, but Hollow Knight tries to capture the best of both worlds with its system.

In Hollow Knight, you bring up the map in game by pressing a button, but initially the player won't be able to see anything. They will need to purchase a map first. The vendor for a map is always located somewhere in the area and they will sell the player the map of the area, but only that area. Also, the map will be unfinished and crudely drawn. The player can see some of the most obvious areas on the map, but not all the nooks and crannies. For that the player has to explore the area themselves without the help of the map. And even with a map, the new parts of the area won't automatically appear onto the map and the player has to go back to a bench to rest (Hollow Knight's save game system is tied to resting on one of the numerous benches throughout the game world.), in order to update the map. And it doesn't even end there. The player also has to have a

compass charm equipped, or otherwise they will be unable to see themselves on the map.

Hollow Knight's system is complicated, but at the same time, rather unique and tries to capture the feeling of being lost, being adventuring, but also giving the players the tools to be able to traverse the kingdom of Hallownest with ease.



PICTURE 26. The area map of Hollow Knight. Different pins mark objects of interest, such as benches. (Hollow Knight 2017)

4.2.2 Metroidvania Elements

Metroidvania is often defined as a game that is not open world per se, but has a sort of facade that makes the game feel like it's open, but in fact is barred by obstacles so that the player can't reach all the areas in whatever order they want, giving the game designers full control over what areas the player can and can't access at any given time.

While barring the player access to areas is definitely not exclusive to metroidvania genre, the way metroidvanias handle accessing the new areas is distinct enough to warrant itself a specific name. In metroidvanias, accessing new areas often requires a traversal ability, such as being able to jump higher or further to reach areas otherwise inaccessible, or a way to destroy certain types of walls. And acquiring these abilities usually means having to find them from other areas that might be barred by a certain

other traversal ability, creating this overlap where different abilities are needed to acquire other abilities. Often there are multiple goals for the player, and the player can tackle these goals in whatever order they desire, using the newly acquired abilities to find secret areas on the way. It's an addictive system and often utilized in games, especially indie titles. (Bycer, J. 2014).

4.2.3 Optional Content

The kind of open-ended design that the metroidvania genre offers, lends itself well for mystery and secrets and it's common in the genre to have secret questlines that may lead to rare and interesting rewards, be it gameplay rewards or narrative rewards, as well as entirely optional areas and in some games, even alternative endings (Bycer, J. 2014). Some games, such as Dark Souls, go to great lengths to ensure that the game has a plethora of optional content, even though it will likely mean that many players will miss on content, which of course is not what you as a designer want. In my opinion however, this makes the game feel more rewarding. It makes you feel like you've discovered something on your own, and that not all players are meant to find it, and that the designers didn't simply funnel you to find interesting things. You as the player, did it yourself.

TABLE 2. Conclusion comparison of all three games.

	Castlevania: SotN	Ori and the Blind Forest	Hollow Knight
Automatic map	X	X	
Optional areas	X	X	X
Optional bosses	X		X
Secret questlines	X		X
Secret ending	X		X

5 DISCUSSION AND QUEEN'S MEADOW

I have been designing video games ever since I was a child and I can't imagine my life without it, and while I know a lot about the subject it is still easy to let my own biases control the way I approach game design. That's why taking a step back and observing the subject from further away and approaching it in an objective manner during the writing of this thesis has been so important in the design of Queen's Meadow.

It's clear that in essence, much of the things that have changed from old-school games to more modern games, have to do with streamlining in general. Especially the trend from an old-school title to a spiritual sequel, the driving force seems to be accessibility and the removal or changing of the more frustrating and unfair mechanics that many old games have. If technology has brought us one thing when it comes to game design, it is the freedom to not having to design our games based on limitations such as storage space, or the need to artificially make the games more difficult. Our limitations now are of much more practical variety and it gives us the artistic freedom to create unforgettable experiences that are true to the designer's visions.

Certain usability elements may have been hindered by technology back in the day, and while it has taken gigantic leaps forward in the past three decades, and I highly doubt anyone really misses the clunky menus of the past, many of the core principles in usability design, such as clarity and ease of use are timeless and will likely always stay as a priority in UI and HUD design in games going forward.

This all brings us to Queen's Meadow, the game I designed and developed to accompany this thesis over the course of autumn 2017 and spring 2018. Its design is largely derivative of the results of the analysis, with of course, my own creative touch to accompany it.

PICTURE 27. Queen's Meadow gameplay screen. (Queen's Meadow 2018)

Being a first-person RPG, the first thing I decided that needed to be figured out was the combat system. Based on the findings in this thesis, I made Queen's Meadow's combat resemble the fundamental's of those in King's Field 4 – The Ancient City. However, from the very beginning I knew I would have to do something about the slowness and slugginess found in King's Field. This was the first issue I decided to solve. I started designing the combat system around a similar kind of stamina management system, but taking away all the waiting and slugginess. The player moves significantly faster in Queen's Meadow, and the stamina regenerates faster, however, at the same time, the player is also penalized from mistakes more as well, to ensure that the challenge will stay in the game. In King's Field 4 – The Ancient City, the challenge often came from being able to manage the slow and cumbersome systems of the game and simply making the game faster would make the game much more difficult for the wrong reasons.

PICTURE 28. Queen's Meadow's combat system in action. (Queen's Meadow 2018)

After the combat, I started to make plans for the world and level design, specifically trying to find good ways to implement metroidvania maps into a small map. Metroidvania really gets into its full potential only when a game is long and whole, and Queen's Meadow was to be only a prototype, meaning that the scale would have to be pulled down significantly. In Queen's Meadow, the player can find a torch as well as a firespell, both of which can be used to access previously inaccessible paths by using the fire to blow up explosive barrels, which then clear a rubble that was previously blocking the player. Different ideas I had which were not implemented into Queen's Meadow, were using a bow and arrow to shoot at levers and such from far away, opening pathways, as well as in a very traditional manner, using different key items to open locked doors and paths.

PICTURE 29. The player uses a torch and an explosive barrel to blow up a wall. (Queen's Meadow 2018)

The inventory system that was implemented into Queen's Meadow isn't as robust as something like Legend of Grimrock, it was designed to be functional first and foremost. The player can see their equipment and items on it, and it can be easily expanded in the future. Plans that didn't make it to Queen's Meadow include a drag and drop interface with tooltips, like in Legend of Grimrock. While the moment to moment gameplay resembles more King's Field 4 – The Ancient City, more than any other games in the comparison, I did think about taking ideas of the inventory system from Legend of Grimrock instead. It's complex, but not too complex, and it's visually pleasing, so using that as template for my own inventory system seemed like a much better idea than the clunky system King's Field 4 – The Ancient City had as its inventory system.

When it comes to the map system in Queen's Meadow, I really wanted to use a system that resembles a real paper map, rather than a clearly laid out map. While I argue in the thesis that there are good and bad ways to make a map system, some systems being way better than others, I still didn't want to go out to make the best map system, when it comes to the information relayed to the player. I believe that some vagueness in the map system is crucial to the mysterious atmosphere that I am going for in Queen's Meadow. So I decided to take ideas from both Hollow Knight as well King's Field 4 – The Ancient City. I wanted the player to find different pieces of the map, that would then make a whole map later on, both similar to Hollow Knight's system but not as complicated, as well as similar to King's Field 4 – The Ancient City's map, but more useful. Unfortunately, the map wasn't ultimately implemented due to time constraints.

Save system was also not implemented into the game, but it was designed. The save system in Queen's Meadow would track the player's progress in small intervals and save the game constantly. The player would be able to find statues of the late 12 queens of the game world, each of them having a small piece of lore describing the queen's backstory in detail, and then the player would be able to use that statue as a checkpoint, and should the player die, they would respawn at the last queen's statue they interacted with. All choices would be permanent and death would be penalized in one way or the other, making every decision count.

For the UI and HUD for Queen's Meadow, I wanted to take a minimalistic approach, but giving the player all the necessary information they would need. For the HUD, I went with the most common option, a non-diegetic HUD. This allows the player to know exactly what is going on at all times, and things like Health and Stamina are important for the player to know at a glance. Likewise, whenever the player looks at an object that can be picked up, a simple prompt will appear on the screen, telling the player that the object can be picked up. The conversation UI is also minimalistic and clear, and the NPCs will simply give the player the information they need without anything extra. An advanced conversation UI would feature buttons to choose different topics to talk about with an NPC, but that was not implemented into Queen's Meadow's prototype. For the main menu, I wanted to use the modern approach of making the main menu part of the game world, highlighting a significant part of the game world for the player.

PICTURE 30. Queen's Meadow's non-diegetic HUD. (Queen's Meadow 2018)

PICTURE 31. Queen's Meadow's main menu that is part of the game world. The menu highlights an important part of the game world, the mysterious shrine gate. (Queen's Meadow 2018)

Queen's Meadow was an ambitious project and a large undertaking to make it the supporting part of this thesis and I've put hundreds upon hundreds of hours into making Queen's Meadow what it is. Not only have I learned trememendous amounts of things during the development of Queen's Meadow, and the writing of this thesis, but this process has also reminded just how passionate I am about game development.

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APPENDICES

Appendix 1. Queen's Meadow